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Study of the combined effect of intrabeam scattering and impedance in a low-emittance ring

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Intra-beam scattering (IBS) is one of the prominent effects for low-emittance rings resulting in a significant growth of the emittance, energy spread, and bunch length. This effect is partially mitigated by the bunch lengthening caused by the longitudinal impedance. However, a significant bunch lengthening provided by higher-harmonic cavities is needed to keep the emittance low enough for achieving the designed brightness. For low-emittance lattices considered as options for the NSLS-II upgrade, we studied a combined effect of the IBS, impedance, and harmonic cavities using analytical formulae and computer simulations.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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